MBOI Snapshot As of 6/30/2017

				(U	naudited)					
Row Labels	Market Value	%	Pension Internal/External Pension Active/Passive		Pension by Plan	Market Value	%			
CAPP CONS ASSET PENSION POOL	\$10,636,933,650	66.80%		LACCING	rens	ion Active	r/ rassive	PUBLIC EMPLOYEES' RETIREMENT2	\$5,456,647,596	50.05
SHORT TERM INVESTMENT POOL	\$2,951,617,376	18.54%	Control of the Contro	Internal 22,70%				TEACHERS' RETIREMENT	\$3,918,700,557	35.949
TRUST FUNDS INVESTMENT POOL	\$2,334,307,333	14.66%			Passive 34.00%			FIREFIGHTERS' RETIREMENT	\$380,437,065	3.499
Grand Total	\$15,922,858,359	100.00%						POLICE RETIREMENT	\$369,615,681	3.399
								SHERRIF'S RETIREMENT	\$330,254,686	3.039
								GAME WARDEN'S RETIREMENT	\$175,141,533	1.619
							Active 66.00%	HIGHWAY PATROL RETIREMENT	\$139,371,985	1.289
			External		-			JUDGES' RETIREMENT	\$96,170,524	0.889
			77.30%			A STATE OF THE PARTY OF THE PAR		VOL. FIREMANS' RETIREMENT	\$36,330,254	0.339
Top Ten Non-Pension Accounts		%						Total	\$10,902,669,880	100.009
STATE FUND INSURANCE	\$1,490,773,731	30.50%		External	Active		Passive	PENSIONS BY ASSE	TS	
TREASURERS	\$813,212,359	16.64%		8,427,763,817	\$ 7,195,762	,121 \$	3,706,907,759	LISTONS DI ASSE	HIGH YIELD PAC	
TRUST AND LEGACY ACCOUNT	\$701,082,982	14.34%	22.70%	77.30%	66	.00%	34.00%	BROAD FIXED NATURAL RESOURCES		
PERMANENT COAL TRUST FUND	\$570,995,519	11.68%		10,902,669,880		\$	10,902,669,880	INCOME PAC 2.27%	CASH EQUIVALENTS PAC	
OTHER AGENCIES	\$437,805,534	8.96%			1			PENSION STIP	1.07%	
TREASURE STATE ENDOWMENT	\$286,618,676	5.86%	Wibor internal	External	MB	OI Active/	/Passive	TIPS PAC	DOMESTIC FOUR	mi bac
TOBACCO TRUST FUND	\$221,857,480	4.54%						MORTGAGE BACKED	35.64%	IIY PAC
MONTANA STATE UNIVERSITY	\$133,749,157	2.74%			Passive			PAC 4.43%		
UCFRB RESTORATION FUND	\$119,174,869	2.44%			20.06%			INVESTMENT GRADE	Y	
RESOURCE INDEMNITY TRUST	\$112,106,872	2.29%		Intern	al		A THE REAL PROPERTY OF THE PARTY OF THE PART	CREDIT PAC		
Total	\$4,887,377,179	100.00%	External 51.11%	48.89			Active 79.94%	4.96N US TREASURY AGENCY PAC 7.24M		
			Internal \$ 8,604,540,405 \$	External 8,995,255,883	Active \$ 14,069,277,	,153 \$	Passive 3,530,519,135.45	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.56% PRIVATE EQUITY PAC	INTERNATION	
Coal Tax Trust	Market Value	%	Internal \$ 8,604,540,405 \$ 48.89%	External 8,995,255,883 51.11%	Active \$ 14,069,277,	.153 \$.94%	Passive	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.56%	INTERNATION 16-929	
Coal Tax Trust BIG SKY ECON DEV FD	Market Value \$99,389,738	% 9.41%	Internal \$ 8,604,540,405 \$ 48.89%	External 8,995,255,883	Active \$ 14,069,277,		Passive 3,530,519,135.45	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.56% PRIVATE EQUITY PAC		
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POO	Market Value \$99,389,738 \$98,126,349	% 9.41% 9.29%	Internal \$ 8,604,540,405 \$ 48.89%	External 8,995,255,883 51.11%	Active \$ 14,069,277,	.94%	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.56% PRIVATE EQUITY PAC		
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL	Market Value \$99,389,738 \$98,126,349 \$1,263,389	% 9.41% 9.29% 0.12%	Internal \$ 8,604,540,405 \$ 48.89%	External 8,995,255,883 51.11% 17,599,796,288	Active \$ 14,069,277,	.94%	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.36% PRIVATE EQUITY PAC 10.46%	16.929	%
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL PERMANENT COAL TRUST FUND	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519	% 9.41% 9.29% 0.12% 54.06%	Internal \$ 8,604,540,405 \$ 48.89% \$	External 8,995,255,883 51.11% 17,599,796,288	Active \$ 14,069,277,	.94%	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.36% PRIVATE EQUITY PAC 10.46% Asset Classes	Market Value	% 35.649
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POO	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226	% 9.41% 9.29% 0.12% 54.06 % 36.49%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati	External 8,995,255,883 51.11% 17,599,796,288	Active \$ 14,069,277,	.94%	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC PRIVATE EQUITY PAC ASSET Classes DOMESTIC EQUITY PAC	Market Value \$3,885,903,235	% 35.649 16.929
COAL TAX Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding	External 8,995,255,883 51.11% 17,599,796,288	Active \$ 14,069,277, 79	.94% \$	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC PRIVATE EQUITY PAC 10.46% ASSET Classes DOMESTIC EQUITY PAC INTERNATIONAL PAC	Market Value \$3,885,903,235 \$1,844,865,342	% 35.64 16.92 10.46
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM Mortgage	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277, 79	.94% \$	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.56% PRINATE EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817	% 35.649 16.929 10.469 7.569
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM Mortgage SHORT TERM INVESTMENT POOL	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 2.37%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277,79 \$ 94,690,\$ 107,880,	.94% \$.437 .000	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.56% PRINVATE EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC REAL ESTATE PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713	% 35.64 16.92 10.46 7.56 7.24
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM Mortgage SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 2.37% 9.40%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277,79 \$ 94,690,\$ 107,880,	.94% \$ 437 000 205	Passive 3,530,519,135.45 20.06%	US TREASURY AGENCY PAC 7.24% REAL ESTATE PAC 7.36% PRIVATE EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC REAL ESTATE PAC US TREASURY AGENCY PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692	% 35.64 16.92 10.46 7.56 7.24 4.96
COAL TAX Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM Mortgage SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM TRUST FUNDS INVESTMENT POO	Market Value \$99,389,738 \$98,1263,389 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523 \$98,745,553	% 9.41% 9.29% 0.12% 54.06% 12.10% 3.09% 2.37% 9.40% 9.35%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers Loan Rate	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277,79 \$ 94,690,\$ 107,880,	.94% \$ 437 000 205	Passive 3,530,519,135.45 20.06%	Asset Classes DOMESTIC EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC US TREASURY AGENCY US TREASURY AGENCY PAC INVESTMENT GRADE CREDIT PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692 \$540,542,501	% 35.64 16.92 10.46 7.56 7.24 4.96 4.43
Coal Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM Mortgage SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523 \$98,745,553 \$569,970	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 2.37% 9.40% 9.35% 0.05%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers Loan Rate STIP	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277,79 \$ 94,690,\$ 107,880,	.94% \$ 437 000 205	Passive 3,530,519,135.45 20.06%	Asset Classes DOMESTIC EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC US TREASURY AGENCY US TREASURY AGENCY PAC INVESTMENT GRADE CREDIT PAC MORTGAGE BACKED PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692 \$540,542,501 \$482,495,676	% 35.64 16.92 10.46 7.56 7.24 4.96 4.43 3.02
COAL TAX Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VILIM Mortgage SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL TREASURE STATE ENDOWMENT	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523 \$98,745,553 \$569,970 \$286,618,676	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 2.37% 9.40% 9.35% 0.05%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers Loan Rate STIP Account	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277,79 \$ 94,690,\$ 107,880,	.94% \$.437 .000 .205 .50%	Passive 3,530,519,135.45 20.06%	ASSET Classes DOMESTIC EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC US TREASURY AGENCY US TREASURY AGENCY PAC INVESTMENT GRADE CREDIT PAC MORTGAGE BACKED PAC TIPS PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692 \$540,542,501 \$482,495,676 \$329,559,871	% 35.64' 16.92' 10.46' 7.56' 7.24' 4.96 4.43' 3.02' 2.44'
COAL TAX Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM MORTGAGE SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL TREASURE STATE ENDOWMENT TRUST FUNDS INVESTMENT POOL	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523 \$98,745,553 \$569,970 \$286,618,676 \$284,913,784	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 2.37% 9.40% 9.35% 0.05% 27.13%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers Loan Rate STIP Account Total State	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277,79 \$ 94,690,\$ 107,880,	.94% \$ 437 .000 205 .50%	Passive 3,530,519,135.45 20.06% 17,599,796,288	ASSET Classes DOMESTIC EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC US TREASURY AGENCY PAC INVESTMENT GRADE CREDIT PAC MORTGAGE BACKED PAC TIPS PAC PENSION STIP	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692 \$540,542,501 \$482,495,676 \$329,559,871 \$265,736,274 \$247,020,579	% 35.649 16.929 10.469 7.569 4.439 3.029 2.449
COAL Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM MORTGAGE SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL TREASURE STATE ENDOWMENT TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL SHORT TERM INVESTMENT POOL SHORT TERM INVESTMENT POOL	\$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523 \$98,745,553 \$569,970 \$286,618,676 \$284,913,784 \$1,493,445	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 9.35% 0.05% 27.13% 26.97% 0.14%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers Loan Rate STIP Account Total State Total Local	External 8,995,255,883 51.11% 17,599,796,288	\$ 14,069,277, 79 \$ 94,690, \$ 107,880,	.94% \$ 437 .000 .205 .50%	Passive 3,530,519,135.45 20.06% 17,599,796,288	ASSET Classes DOMESTIC EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC US TREASURY AGENCY US TREASURY AGENCY PAC INVESTMENT GRADE CREDIT PAC MORTGAGE BACKED PAC TIPS PAC PENSION STIP BROAD FIXED INCOME PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692 \$540,542,501 \$482,495,676 \$329,559,871 \$265,736,274 \$247,020,579 \$221,217,286	% 35.644 16.925 10.465 7.245 4.965 4.435 3.025 2.444 2.275 2.035
COAL Tax Trust BIG SKY ECON DEV FD TRUST FUNDS INVESTMENT POOL PERMANENT COAL TRUST FUND TRUST FUNDS INVESTMENT POOL IN STATE LOANS VHLM MORTGAGE SHORT TERM INVESTMENT POOL TREASURE ST. REG. WATER SYSTEM TRUST FUNDS INVESTMENT POOL SHORT TERM INVESTMENT POOL TREASURE STATE ENDOWMENT TRUST FUNDS INVESTMENT POOL	Market Value \$99,389,738 \$98,126,349 \$1,263,389 \$570,995,519 \$385,499,226 \$127,776,719 \$32,635,702 \$25,083,872 \$99,315,523 \$98,745,553 \$569,970 \$286,618,676 \$284,913,784 \$1,493,445 \$211,447	% 9.41% 9.29% 0.12% 54.06% 36.49% 12.10% 3.09% 2.37% 9.40% 9.35% 26.97% 0.14% 0.02%	Internal \$ 8,604,540,405 \$ 48.89% \$ Intercap Stati Loans Outstanding Bonds Outstanding Number of Borrowers Loan Rate STIP Account Total State	External 8,995,255,883 51.11% 17,599,796,288 stics #Accounts 321 163 484	\$ 14,069,277, 79 \$ 94,690, \$ 107,880, \$ 2 Total Market Va \$ 1,928,613,	.94% \$ 437 .000 .205 .50%	Passive 3,530,519,135.45 20.06% 17,599,796,288	Asset Classes PRIVATE FQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC INTERNATIONAL PAC PRIVATE EQUITY PAC US TREASURY AGENCY PAC INVESTMENT GRADE CREDIT PAC MORTGAGE BACKED PAC TIPS PAC PENSION STIP BROAD FIXED INCOME PAC NATURAL RESOURCES PAC	Market Value \$3,885,903,235 \$1,844,865,342 \$1,140,212,817 \$823,743,713 \$789,417,692 \$540,542,501 \$482,495,676 \$329,559,871 \$265,736,274 \$247,020,579	14

PUBLIC EMPLOYEES RETIREMENT PLAN*

SUMMARY OF POSITIONS AND RETURNS

June 30, 2017



	MARKET VALUE \$(000)	ALLOCATION (%)
Allocation		
PUBLIC EMPLOYEES RETIREMENT PLAN	5,456,776	100.0
SHORT TERM INVESTMENT POOL	130,617	2.4
CONSOLIDATED ASSET PENSION POOL (CAPP)	5,326,159	97.6

	MONTH	3 Months	FYTD	1 Year	3 Years	5 Years	10 Years	Inception To Date	INCEPTION DATE
Returns									
PUBLIC EMPLOYEES RETIREMENT PLAN	0.50	3.03	11.94	11.94	6.12	9.62	5.33	7.70	07/01/1994
SHORT TERM INVESTMENT POOL	0.09	0.26	0.83	0.83	0.45	0.35	0.85		04/01/1990
CONSOLIDATED ASSET PENSION POOL (CAPP)	0.50	3.13						3.13	04/01/2017
PUBLIC EMPLOYEES CUSTOM BENCHMARK 1	0.70	2.55	11.95	11.95	6.58	10.05	5.65		12/01/1993
LIBOR 1 MONTH (DAILY)	0.10	0.27	0.78	0.78	0.43	0.33	0.78		01/01/1997
CAPP CUSTOM BENCHMARK ²	0.71	2.62				2.00	5.70		04/01/2017

PUBLIC EMPLOYEES RETIREMENT PLAN*

SUMMARY OF POSITIONS AND RETURNS

June 30, 2017



Endnotes

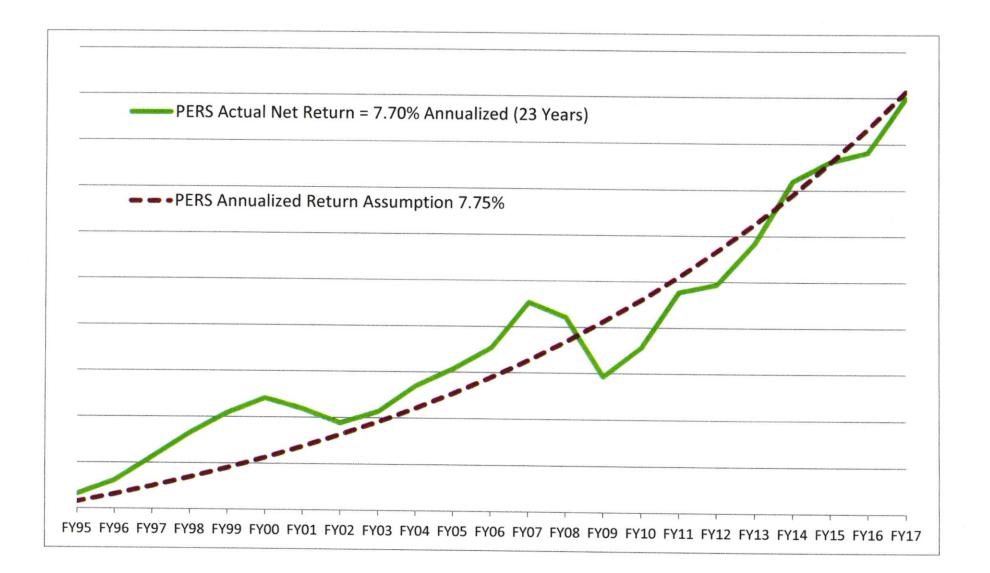
- * Net All
- 1 From inception to 3/31/2017:

The portfolio weighted average of S&P 1500 Super Composite, MSCI ACWI ex US IMI Net, S&P 1500 + 4% Qtr Lag, LIBOR 1 Month, BBG BARC US Agg, and NCREIF ODCE 1 Qtr Lag (Net) From 4/1/2017 to present:

Equity and Cash Equivalents weighted average of CAPP Custom Benchmark and LIBOR 1 Month (Daily)

2 From inception to present:

The portfolio weighted average of MSCI US IMI Gross, MSCI ACWI ex US IMI Net, MSCI AC World Commodity Prod Net, BBG Barclays US Intermediate TIPS, BBG BARC Tsy Int, BBG BARC US Corp Int Inv Grd Idx, BBG BARC US MBS Idx, BBG BARC US HY - 2% Issr Cap, MSCI US REIT INDEX GROSS, MSCI USA Small Cap Gross, BBG BARC US Agg, LIBOR 1 Month



TRS Cash Flow Analysis

November, 2016

Joe Cullen, CFA, CAIA, FRM

Dan Zarling, CFA

Eron Krpan, CIPM

Cash Flow Analysis

- Prior Years CF analysis
 - Aggregated PERS & TRS cash flows
 - Considered implied asset sales rather then total distributions
 - Focused on a 5 year rather 10 year cash flow analysis
- Going forward each plan will have their own cash flow analysis
 - All 9 plans have different Net Cash Needs (NCN) and funded ratios.
 - As we progress, asset allocation may be individualized for the unique needs and risk characteristic of each plan.
- As an example, TRS will be the subject of this presentation
 - Their NCN (as a % of assets) is the largest of all 9 plans

Excerpts from Actuarial Valuation As of July 1, 2016

Done by: Cavanaugh Macdonald Consulting, LLC

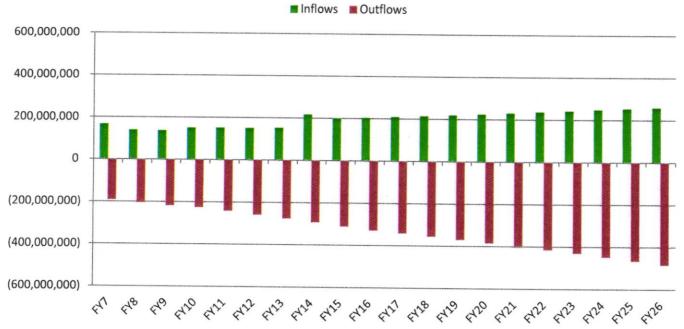
- "The investment return generally has the largest impact on the funding of the system"
 - If the amortization period is > 30 years, the actuary will recommend a contribution rate increase
- If the market value of assets were used
 - Funded Ratio:66.7%
 - Amortization Period: 28Years

- Investment Return
 Assumption Scenarios
 - 7.75% (Current)
 - Funded Ratio: 69.3%
 - Amortization Period: 24
 Years
 - -7.25%
 - Funded Ratio: 65.7%
 - Amortization Period: 34
 Years
 - 6.75%
 - Funded Ratio: 62.2%
 - Amortization Period: 51
 Years

Why is there a NCN?

- The plan is mature. There are more retirees than fulltime contributing members.
 - As of 7/1/2016 there were 12,769 full-time contributing members and 15,164 retired members and beneficiaries
- Pensioners are living longer lives causing benefit outflows to be larger than expected.

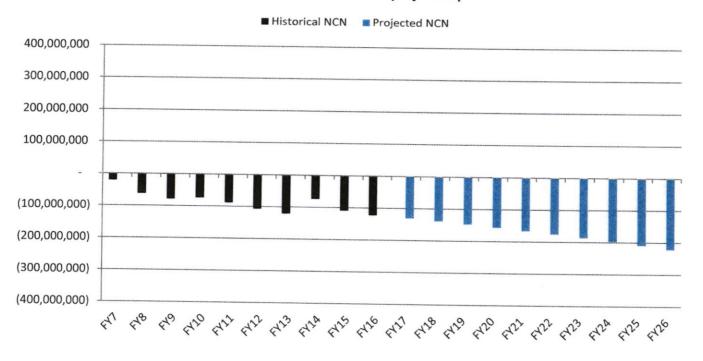
Inflows & Outflows Historical & Projected (Shaded area indicates projection)



- Inflows are expected to grow at around 2.5% per year for the next 10 years
- Outflows are expected to grow at around 4% per year for the next 10 years

TRS Net Cash Need

Historical & Projected (Shaded area indicates projection)

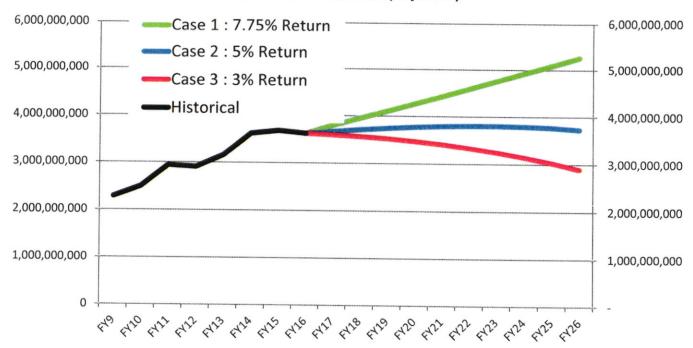


- Net Cash Need (NCN) is the net amount of inflows and outflows.
- NCN is expected to grow at around 6% per year for the next 10 years
- Liquidity management will be an increasingly important consideration in the asset allocation of this plan.

TRS Ending FY Assets

Historical & Projected

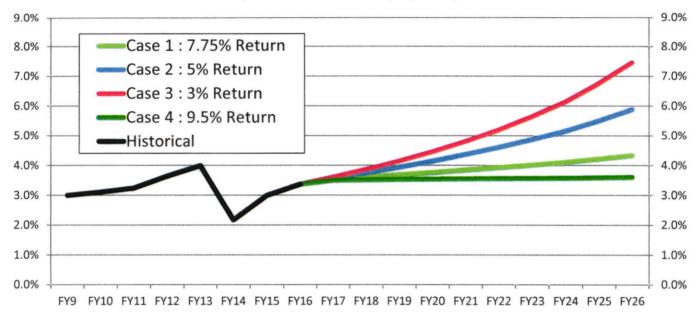
(Shaded area indicates projection)



- Returns are assumed to be the same each year, without variation, in their respective scenarios
- It would take about a 5% annual return to keep the plan assets close to where they
 are now with respect to the market value of TRS plan assets

TRS Sensitivity Analysis - Constant Returns NCN as % of Average FY Assets

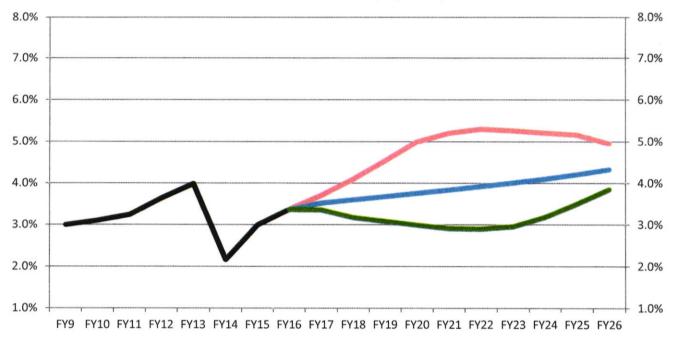
(Shaded area indicates projection)



- Returns are assumed to be the same each year, without variation, in their respective scenarios
- NCN is expected to grow at 6% annually over the next ten years.
- TRS would need to generate an even return of about 9.5% annually (Case 4) in order to keep NCN as a % of Assets at about 3.4%.

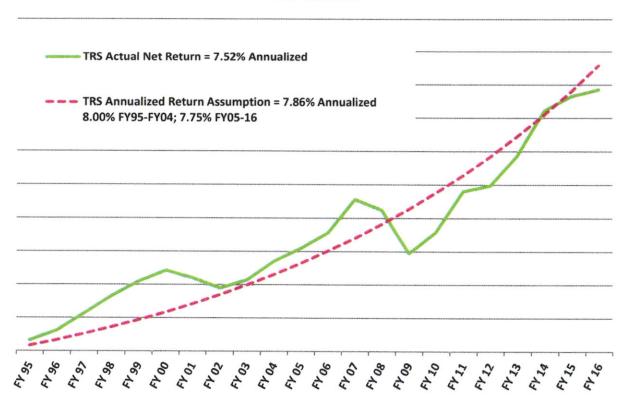
TRS Sensitivity Analysis - Non-Constant Returns NCN as % of Average FY Assets

(Shaded area indicates projection)



- Returns are likely to exhibit volatility
 - Geometric Mean -> An annualized measure of compound return
 - Arithmetic Mean -> The simple average of a set of returns
- High (Low) returns in early years have a positive (negative) impact

Volatility of Historical TRS Returns



 Historical data closely tracks the actuarial assumed target rate of return over the long term

Cash Flow Analysis

Implications for Asset Allocation

- Liquidity Short Term Cash Needs
 - Increasing Net Cash Need -> Higher Cash Levels
 - Gives us flexibility to rebalance, pay benefits, or strategically allocate to other asset classes
- Solvency Long Term Asset Needs
 - Underfunded Status
 - Increases desire to allocate to riskier asset classes
 - Riskier asset allocations could lead to an even more underfunded status